General

Guideline Title

Practice parameters for the non-respiratory indications for polysomnography and multiple sleep latency testing for children.

Bibliographic Source(s)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The levels of evidence (1-4) and levels recommendation (Standard, Guideline, and Option) are defined at the end of the "Major Recommendations" field.

Hypersomnia

1. The multiple sleep latency test (MSLT), preceded by a nocturnal polysomnogram (PSG), is indicated in children as part of the evaluation for suspected narcolepsy. (STANDARD)
2. The MSLT, preceded by nocturnal PSG, is indicated in children suspected of having hypersomnia from causes other than narcolepsy to assess excessive sleepiness and to aid in differentiation from narcolepsy. (OPTION)

Parasomnias

1. The polysomnogram using an expanded electroencephalography (EEG) montage is indicated in children to confirm the diagnosis of an atypical or potentially injurious parasomnia or differentiate a parasomnia from sleep-related epilepsy when the initial clinical evaluation and standard EEG are inconclusive. (OPTION)
2. Children with frequent non-rapid eye movement (NREM) parasomnias, epilepsy, or nocturnal enuresis should be clinically screened for the presence of comorbid sleep disorders, and polysomnography should be performed if there is a suspicion for sleep-disordered breathing or periodic limb movement disorder. (GUIDELINE)

Sleep-Related Movement Disorders

1. Polysomnography is indicated in children suspected of having restless leg syndrome (RLS) who require supportive data for diagnosing RLS.

     (OPTION)

2. PSG is indicated for children suspected of having periodic limb movement disorder (PLMD) for diagnosing PLMD. (STANDARD)

3. Polysomnography is not routinely indicated for evaluation of children with sleep-related bruxism. (STANDARD)

Definitions:

Levels of Evidence

Level	Description
1	Evidence provided by a prospective study in a broad spectrum of persons with the suspected condition, using a reference (gold) standard for case definition, where test is applied in a blinded fashion, and enabling the assessment of appropriate test of diagnostic accuracy. All persons undergoing the diagnostic test have the presence or absence of the disease determined. Level 1 studies are judged to have a low risk of bias.
2	Evidence provided by a prospective study of a narrow spectrum of persons with the suspected condition, or a well designed retrospective study of a broad spectrum of persons with an established condition (by "gold standard") compared to a broad spectrum of controls, where test is applied in a blinded evaluation, and enabling the assessment of appropriate tests of diagnostic accuracy. Level 2 studies are judged to have a moderate risk of bias.
3	Evidence provided by a retrospective study where either person with the established condition or controls are of a narrow spectrum, and where the reference standard, if not objective, is applied by someone other than the person that performed (interpreted) the test. Level 3 studies are judged to have a moderate to high risk of bias.
4	Any study design where test is not applied in an independent evaluation or evidence is provided by expert opinion alone or in descriptive case series without controls. There is no blinding or there may be inadequate blinding. The spectrum of persons tested may be broad or narrow. Level 4 studies are judged to have a very high risk of bias.

American Academy of Sleep Medicine Levels of Recommendations

Term	Definition
Standard	This is a generally accepted patient-care strategy that reflects a high degree of clinical certainty and generally implies the use of Level 1 evidence, or overwhelming Level 2 evidence.
Guideline	This is a patient-care strategy that reflects a moderate degree of clinical certainty and implies the use of Level 2 evidence or a consensus of Level 3 evidence.
Option	This is a patient-care strategy that reflects uncertain clinical use and implies either inconclusive or conflicting evidence or conflicting expert opinion.

Adapted from Eddy DM (Ed.). A manual for assessing health practices and designing practice policies: the explicit approach. Philadelphia, PA: American College of Physicians; 1992.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Non-respiratory sleep disorders, including hypersomnias, parasomnias, and sleep-related movement disorders

Guideline Category

Diagnosis

Evaluation

Screening

Clinical Specialty

Family Practice

Pediatrics

Sleep Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Physician Assistants

Physicians

Guideline Objective(s)

To present practice parameters for the indications of polysomnography (PSG) and the multiple sleep latency test (MSLT) in the assessment of non-respiratory sleep disorders in children

Target Population

Children with suspected non-respiratory sleep disorders

Interventions and Practices Considered

1. Polysomnography (PSG)
2. Multiple sleep latency test (MSLT)
3. Screening for comorbid sleep disorders

Major Outcomes Considered

Clinical and diagnostic utility, technical feasibility, validity, reliability, sensitivity, specificity, and positive predictive value of polysomnography and multiple sleep latency testing

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Strategy

The project was divided into sections in order to systematically analyze the medical literature for the indications for and clinical utility of comprehensive attended level I polysomnography (PSG) in: (1) narcolepsy and other hypersomnias; (2) parasomnias; (3) sleep-related movements disorders (SRMD); and 4) sleep in special populations. Searches were also performed for evidence on the use of multiple sleep latency testing and maintenance of wakefulness test in children. Technical guidelines for PSG are not addressed because these have been addressed in the American Academy of Sleep Medicine (AASM) Scoring Manual. Also not reviewed is the use of nap studies or home PSG because of limited evidence for these in children.

Search terms and search strategies with which to query the medical literature for the indications for and clinical utility of comprehensive, attended level I PSG in pediatric patients were developed. Explicit inclusion criteria, publication date range, and other search limitations were used (summarized below).

Inclusion Criteria

- Greater than or equal to 10 subjects
- Subjects must be less than or equal to 18 years of age (at least >1 month, no newborns)
- Must have PSG data (not home PSG) including electroencephalography (EEG), electromyography (EMG), and respiratory parameters

Limits

- English language
- Human subjects

Publication Date Range: 1966 through September 2010

A complete list of search terms for each category is provided on the AASM Web site (http://www.aasmnet.org/practiceguidelines.aspx). Using PubMed for the literature search, a master list of potential evidence papers was assembled. Two task force members were assigned to review the candidate abstracts and identify those papers that definitively met the criteria for inclusion. If the two members disagreed regarding inclusion/exclusion of a particular paper, additional ratings were obtained by other task force members. The task force chair provided the final opinion in cases of disagreement. Accepted articles were assigned to the appropriate section(s) of the review paper.

A second method of finding candidate papers called "pearling" was also used. Pearling identifies additional papers suitable for evidence by searching the citations of papers already included as evidence or alternatively, utilizing a task force member's personal knowledge of literature in the field. Pearled articles underwent the same review process.

Number of Source Documents

Approximately 4,450 total candidate papers were identified and screened using the inclusion criteria, and 76 were selected as evidence.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

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1	Evidence provided by a prospective study in a broad spectrum of persons with the suspected condition, using a reference (gold) standard for case definition, where test is applied in a blinded fashion, and enabling the assessment of appropriate test of diagnostic accuracy. All persons undergoing the diagnostic test have the presence or absence of the disease determined. Level 1 studies are judged to have a low risk of bias.
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Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Data Extraction and Evidence Grading Process

The data extraction and evidence grading process was similar to that used in Respiratory Indications for Polysomnography in Children, except an Excel spreadsheet was used to summarize and manage the data extraction and evidence grading. The completed evidence table is available at (http://www.aasmnet.org/practiceguidelines.aspx   ).

The evidence grading system (see the "Rating Scheme for the Strength of the Evidence" field) was modified from one developed by the American Academy of Neurology specifically for assessing the clinical utility of diagnostic tests. The system designates four levels of evidence: studies judged level 1 have stronger scientific evidence and a lower risk of bias, while level 4 have weaker scientific evidence and a higher risk of bias. Weaker levels of evidence indicate the need to integrate greater clinical judgment when applying the results to clinical decision making.

Results

The evidence in each article was graded by a primary and secondary reviewer of the task force, with grades obtained from additional reviewers if the two disagreed. Grading by the primary and secondary reviewers were in excellent agreement (gamma = 0.94, probability (P)<0.05) overall. For the papers on which there was disagreement, the secondary reviewer was in better agreement with the additional reviewers (gamma ranged from 0.92-1.0 with P<0.05 for all additional comparisons to the secondary rating, but gamma ranged from 0.39-1.0 for the additional comparisons to the grade of the primary reviewer).

The interpretation of sleep research in children with non-respiratory sleep disorders was challenging, at times, due to the significant procedural variability between studies. Methodological concerns identified included: (1) variability in diagnostic, recording, and scoring methods, (2) presence of identified or unidentified comorbid conditions that potentially account for the polysomnography findings, (3) variability in the age range and pubertal status of the subjects, (4) normative values and selection of appropriate control groups, and (5) potential risk of both type 1 and type 2 error when multiple measures are obtained and analyzed on small samples of subjects. These concerns were identified and cited in the evidence tables.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

To assess the indications for polysomnography (PSG) in children, the American Academy of Sleep Medicine (AASM) in 2007 commissioned a task force to review the evidence and develop practice parameters for the indications of PSG in children. Because of the large number of studies identified, the project was divided into three separate sections to be published separately: (1) the respiratory indications for PSG in children—published in March 2011 (see the NGC summary Practice parameters for the respiratory indications for polysomnography in children); (2) the non-respiratory indications for PSG in children—this report; and (3) the potential role for PSG in children with attention-deficit/hyperactivity disorder—to be published in the future.

The task force and Standard Practice Committee (SPC) liaisons made a list of questions or issues regarding non-respiratory indications for PSG in children. From this, Population, Intervention, Comparison, and Outcome (PICO) tables were developed which guided the review process to be focused on clinically relevant issues. PICO tables for this project are available on the AASM website (http://www.aasmnet.org/practiceguidelines.aspx   ). The task force then: (1) reviewed previous AASM publications and papers produced by other organizations for PSG indications; (2) developed a literature search strategy; (3) established criteria for selecting relevant papers; (4) developed procedures for extracting data and grading the strength of evidence of selected papers; and (5) collated and summarized the evidence. The task force, SPC liaisons, and AASM support staff held monthly telephone conference calls and yearly face-to-face meetings.

In most cases recommendations were based on evidence from studies published in the peer-reviewed literature. When scientific data were absent, insufficient, or inconclusive, the collective opinion was obtained from experts comprising the pediatric task force and the SPC. The RAND/University of California, Los Angeles (UCLA) Appropriateness Method was used to rate each of the recommendations. The RAND/UCLA Appropriateness Method is a tool that measures the appropriateness of recommendations for care or performing procedures developed through the combination of the best scientific evidence available and the collective judgment of experts. The panel of experts, comprised of the SPC and the task force, individually completed voting sheets to rate the appropriateness of each recommendation. Based on these ratings, the recommendations were all classified to be appropriate.

Rating Scheme for the Strength of the Recommendations

American Academy of Sleep Medicine Levels of Recommendations

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Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The systematic review of the evidence was critically reviewed by two outside experts, and the concerns that were raised were addressed by the task force prior to submission to the Board.

The Board of Directors of the American Academy of Sleep Medicine approved these recommendations.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use polysomnography and multiple sleep latency testing in children with suspected non-respiratory sleep disorders

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

- These practice parameters define principles of practice that should meet the needs of most patients in most situations. These guidelines should not, however, be considered inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding propriety of any specific care must be made by the physician, in light of the individual circumstances presented by the patient, available diagnostic tools, accessible treatment options, and resources.
- The American Academy of Sleep Medicine (AASM) expects these guidelines to have an impact on professional behavior, patient outcomes, and, possibly, health care costs. These practice parameters reflect the state of knowledge at the time of publication and will be reviewed, updated, and revised as new information becomes available.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Resources

Staff Training/Competency Material

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Aurora RN, Lamm CI, Zak RS, Kristo DA, Bista SR, Rowley JA, Casey KR. Practice parameters for the non-respiratory indications for polysomnography and multiple sleep latency testing for children. Sleep. 2012 Nov 1;35(11):1467-73. [77 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Nov

Guideline Developer(s)

American Academy of Sleep Medicine - Professional Association

Source(s) of Funding

American Academy of Sleep Medicine

Guideline Committee

Standards of Practice Committee

Composition of Group That Authored the Guideline

Standards of Practice Committee Members: R. Nisha Aurora, MD; Carin I. Lamm, MD; Rochelle S. Zak, MD; David A. Kristo, MD; Sabin

R. Bista, MD; James A. Rowley, MD; Kenneth R. Casey, MD, MPH

Pediatric Task Force Members: Suresh Kotagal, MD; Cynthia D. Nichols, PhD; Madeleine M. Grigg-Damberger, MD; Carole L. Marcus, MBBCh; Manisha B. Witmans, MD; Valerie G. Kirk, MD; Lynn A. D'Andrea, MD; Timothy F. Hoban, MD

Financial Disclosures/Conflicts of Interest

All members of the American Academy of Sleep Medicine Standards of Practice Committee, the pediatric task force and the Board of Directors completed detailed conflict-of-interest statements and were found to have no conflicts of interest with regard to this subject.

This was not an industry supported study. The authors have indicated no financial conflicts of interest.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the American Academy of Sleep Medicine (AASM) Web site.

Print copies: Available from the Department of Science & Research, American Academy of Sleep Medicine, 2510 North Frontage Road, Darien, IL 60561. Web site: www.aasmnet.org.

Availability of Companion Documents

The following are available:

- Non-respiratory indications for polysomnography and related procedures in children: an evidence-based review. Sleep 2012;35(11):1451-66. Electronic copies: Available from the American Academy of Sleep Medicine (ASSM) Web site.
- Interpreting sleep studies: pediatric PSG interpretation: non-respiratory Disorders. Available for a fee from the ASSM Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on February 5, 2012. The information was verified by the guideline developer on March 5, 2013.

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